man, wherever he existed, used as writing materials such natural objects as were readily obtainable. Strips of bark, dressed skins, pieces of wood, bones, flat pieces of slate or stone, rocks, clay, &c.; when he was sufficiently advanced to beat out or to cast plates of metal, iron and bronze were also used by him for this purpose. At a later period he found out the way to make papyrus and paper, and this once done the task of the writer was comparatively simple. His pen varied with the substance which he wrote upon; wood, stone and metal demanded a hard, sharp instrument, and skin and paper demanded only an object which would transmit the writing fluid to their surface in regular quantities at the will of the writer. Ink was in its earliest form simply a mixture of water with some burnt vegetable substance or mineral earth. The style and character of the writing were modified by the materials used; and this is only a natural result when we consider how easy it is to draw circles, curved lines, and intricate devices upon a smooth substance like dressed skin or paper, and how hard it becomes to cut the same in stone. From the Chinese and cuneiform characters we may learn how, little by little, the original picture forms disappeared before the general use of stone and clay, and we know that the style of writing which was used for State documents was very different from that employed in the ordinary business of life. In the clay tablets of the last Assyrian Empire, about B.C. 700, the cuneiform characters bear no resemblance whatever to those which are found on the monuments of the period of Entenna, about B.C. 4500; in the Demotic writing of Egypt, so far back as the period of the Ptolemies, the pictorial character of the ancient hieroglyphics (from which it was derived, through the intermediate form of the hieratic or cursive form of writing employed by the priests) has quite disappeared. When we come to consider the characters used for writing purposes among the North American Indians, so ably discussed by Mr. Garrick Mallery (see "Sign Language among North American Indians," in the *First Annual Report of the Bureau of Ethnology*, p. 263 ff.), we find many pictures which show that they have much in common with picture signs in other languages. The sun is represented by a circle, as in Egyptian and Babylonian; sometimes it has rays shooting out all round it, just as we may see it in one of the vignettes of the ninety-second chapter of the "Book of the Dead." Sunrise is symbolised by a part of the disk showing above the ground; in Egyptian the disk is seen rising between two mountains. The star is represented by a small circle with four rays shooting from it, each towards a cardinal point; in Egyptian the star often has five points, but one of them probably represents the rope or chain by which the Egyptians thought it was hung out in the sky, and in Babylonian a star usually has eight points. The moon is represented by a crescent, as in Egyptian, Chinese, and Babylonian; heaven is a vaulted space, but in Egyptian it is drawn like the flat roof of a house, and has, moreover, supports by which it stands firm on the earth. To represent clouds a number of dark conical masses are drawn within the vault of heaven; the common Egyptian determinative for words meaning cloud is a tress of hair, and it is probable that this idea is common to both Egyptians and Indians. Similarly among both peoples rain was represented by lines of water falling from the sky. In fact it would seem that natural objects, both animate and inanimate, were written always in the same way, whether the writers were Chinese, or Egyptian, or Babylonian, or people of Western Asia, or the makers of the Cretan pictographs which Mr. A. J. Evans has discovered, or North American Indians. Abstract ideas were probably expressed quite differently by all nations; but even to touch on this far-reaching subject would be beyond the scope of this short notice. It must, however, be mentioned in passing that Mr. Garrick Mallery has collected a series of most important facts in connection with this subject in his "Pictographs of the North-American Indians" (see *Fourth Annual Report of the Bureau of Ethnology*), a work which should be consulted by all who study the history of the development of writing in the world, and that he has further supplemented our knowledge of the subject by his later work, "Picture-writing of the American Indians" (see *Tenth Annual Report of the Bureau of Ethnology*). It is a curious fact that the peoples of North America did not invent an alphabet, as many of the other nations of the world have done, for it is clear to every one that a system of picture-writing, however simple, is really a cumbrous affair, and the misreading of a picture sign might be at times accompanied by dire consequences. At a very early period Chinese, Babylonians, and Egyptians introduced an alphabetic principle into their writing, and the Persians succeeded in abolishing entirely the picture element from their system. The other volumes of Reports are, each in its way, as interesting as those to which we have called attention, and from them we may learn that light and information can come from the West as well as from the East. The carefully made collections of ethnological facts, which we find in the series of works issued under the able direction of Mr. Powell, should do much to help and encourage other workers in their inquiries, and the scholarly way in which they have been set forth by his fellow-workers reflects the greatest credit upon the Smithsonian Institution, and upon all who have been connected with their publication.

NOTES.

IT is stated that Lord Rayleigh has intimated to the Council of the Royal Society that he does not intend to seek re-election as one of the Secretaries of the Society.

THE President of the Royal Society (Sir Joseph Lister) will preside at Prof. Dunstan's lecture at the Imperial Institute next Monday evening.

LORD KELVIN has been suffering for some time past from severe neuralgia in the head; but he is now much better, and was able on Saturday to attend at the Royal Society for an hour.

THE celebration of the seventieth birthday of Prof. Stanislao Cannizzaro at Rome has been postponed to November 21, on account of the anniversary on July 12 falling in the University vacation. A Committee has been formed and has collected subscriptions, which are to be devoted partly to the production of a gold medal commemorative of the anniversary, the balance being handed to Prof. Cannizzaro to be applied at his discretion in the interests of science. Congratulatory addresses will be presented from various learned societies, and there will also be a ceremonial presentation of the medal and subscribed fund.

THE recent Conference at Burlington House on the proposed International Catalogue of Scientific Publications appears to have stimulated interest in the subject-index to the Royal Society's "Catalogue of Scientific Papers," upon which the Society's staff is already engaged. The College Section of the American Library Association at their meeting last month unanimously passed the following resolution:—"That the Section has learned with great satisfaction that the Council of the Royal Society proposes to add to the debt which the scientific world already owes to it for its valuable 'Catalogue of Scientific Papers,' by making a subject-index to the papers contained therein."

A MEETING of the executive committee which has been formed in connection with the submarine telegraph memorial, was held on Friday last. Two resolutions were adopted as follows:—"That it is desirable to establish a memorial to the late Sir John Pender, G.C.M.G., to commemorate the leading part he took in the establishment and development of submarine telegraphy, and in its extension throughout the world." "That measures be taken for promoting in the year 1901 a general international memorial recording the jubilee of international submarine telegraphy." A meeting of the general committee will be held in about a fortnight, when the decision arrived at will be submitted for confirmation.

CHRISTMAS lectures specially adapted for children will this year be given at the Royal Institution by Prof. Silvanus P. Thompson, F.R.S., his subject being "Visible and Invisible Light." Prof. Augustus D. Waller, F.R.S., has been appointed Fullerian Professor of Physiology for three years, the appointment to date from January 13, 1897; and Dr. Alexander Scott has been made the Superintendent of the Davy Faraday Research Laboratory of the Royal Institution, the Directors being Lord Rayleigh and Prof. Dewar.

MR. R. ETHERIDGE, late of the Geological Department of the British Museum, has been awarded by the Royal Geological Society of Cornwall its first Bolitho gold medal, in consideration of his services to Palæontological science.

THE objects exhibited in the ethnographical section of the Millennial Exhibition at Budapest are to be used as the nucleus of an ethnographical museum. The collection of machines in the special exhibition of the means of tranſport are to form a railway museum, and the bulk of the exhibits in the agricultural section will be used for the foundation of an agricultural museum.

A REUTER correspondent at St. John's reports further mineral discoveries in Newfoundland. An immense deposit of silver and lead ore has been discovered at Lawn, on Placentia Bay. The lode is said to be one mile long and 18 feet deep, and is described as very rich. An offer of £50,000 for the mining rights is reported to have already been made. Rich gold-bearing quartz reefs have been found at Ming's Bight, 200 miles north of St. John's.

SCIENCE has just lost an eminent investigator and teacher by the death of Dr. H. Newell Martin, F.R.S., late professor of biology in the Johns Hopkins University, Baltimore, U.S.A. In conjunction with Huxley, Prof. Martin wrote a manual of "Practical Instruction in Elementary Biology," which was published in 1875. He was also the author of a number of text-books of physiology; and the seventh edition of his admirable volume on the structures and activities of "The Human Body" reached us only a few days ago. Prof. Martin was in his forty-eighth year.

IT is reported in *Science*, upon the authority of the Honolulu correspondent of the United Associated Presses, that Mr. C. R. Bishop has authorised the Trustees of the Bishop Museum to expend 750,000 dols. in building an aquarium and marine biological station at Honolulu, for the scientific study of marine life in the Pacific. Prof. W. T. Brigham has just returned from visiting European aquariums, and is prepared to complete the plans. A body of professors and investigators will be maintained, and students will doubtless be attracted from Europe and America.

WE regret to announce the death of Dr. Moritz Schiff, professor of physiology in the University of Geneva, at the age of seventy-six; of Dr. Julius T. Wolff, the director of the private observatory—Photometrisches Observatorium—at Bonn, and the last of Argelander's pupils, at the age of seventy-six; of Prof. Dr. Eugen Sell, honorary professor of chemistry in Berlin University, at the age of fifty-four; and of Prof. Gustav Kieseritski, professor of mathematics at the Polytechnic Institute in Riga.

THE death is announced of M. Lucien Trécul, an eminent botanist, and member of the Paris Academy of Sciences. The Paris correspondent of the *Chemist and Druggist* gives the following particulars as to Trécul's life:—"He was seventy-eight years of age, having been born at Mondoubleau (Loir and Cher) in 1818. He studied pharmacy in Paris, and became a hospital pharmacist in 1841, his best-known contemporaries being MM. Chatin, a former director of the Paris School of Pharmacy, and Georges Ville, professor of agriculture at the Museum. About this time Trécul was attracted by the study of botany, and soon afterwards devoted himself entirely to it. Early in 1848, he was asked by the Minister of Agriculture and the Paris Natural History Museum to go to the United States to study the feculent roots used for alimentary purpoſes by the Indian tribes of North America. He left France early in the same year, and for a long time followed an Indian tribe in its wanderings over the prairies near the Rocky Mountains. He got together a superb collection of plants and animals. The ship carrying them to France was, however, lost in a storm during her voyage. M. Trécul, not discouraged, recommenced his work. He proceeded to Texas and Mexico, from whence he sent valuable collections to the Paris Museum." He was a Chevalier of the Legion of Honour, and became a member of the Paris Academy of Sciences in 1856. For the past forty years, or more, he lived a very secluded life, and was only heard of by occasional communications to the Paris Academy, and through his written works.

NANSEN'S narrative, the forthcoming publication of which, in a newspaper, was warmly referred to in a note last week, appeared in the *Daily Chronicle* of Monday, Tuesday, and Wednesday. Never before, in our knowledge, has such a stirring story been told of life amidst the ice and snow of the frozen north, and certainly never has the pages of a daily paper been embellished with such brilliant illustrations as those which accompany Nansen's articles. Naturally the account deals almost entirely with the adventurous aspect of the expedition; and as this was summarised (from telegrams communicated by Nansen to the *Daily Chronicle*) in our issues of August 20 and September 3, no useful purpose would be served by repeating the descriptions then given. The geographical results of the expedition, so far as they have yet been made known, were brought together by Dr. Mill in an article which appeared in these columns on August 27. In his three articles in the *Chronicle*, Dr. Nansen carefully avoids going into any scientific details, and he is probably reserving these for the paper he will read before the Royal Geographical Society early next year. One or two natural history observations are, however, mentioned in the course of the narrative. In the neighbourhood of four islands in latitude 81° 38′ N. and longitude 63° E., in August 1895, large numbers of the rare Ross's gull (*Rhodostethia rosea*) were seen. We read: "This, the most markedly polar of all bird forms, is easily recognisable from other species of gull by its beautiful rose-coloured breast, its wedge-shaped tail, and airy flight. It is without comparison the most beautiful of all the animal forms of the frozen regions. Hitherto it has only been seen by chance on the utmost confines of the unknown Polar Sea, and no one knew whence it came or whither it went; but here we had unexpectedly come upon its native haunt, and although it was too late in the year to find its nests, there could be no doubt about its breeding in this region." From November 1895 to March 1896, no bears were seen, but foxes, both of the white variety and of the valuable dark-furred kind, constantly came to the hut where Nansen and Johansen passed the winter. With the spring, a few days after the sun had appeared above the horizon, a flock of little auks was seen sailing past along the mountains to the north, and soon the mountains swarmed with them. The whole of that part of Franz Josef Land traversed by the two explorers consisted of basalt, and once formed a continuous basaltic land, which is now, however, cut up into small islands. On the south side of the country a deep stratum of Jurassic clay occurs beneath the basalt, and in it was found numerous ammonites and belemnites. The proprietors of the *Daily Chronicle* deserve every credit for their enterprise in arranging to pay Dr. Nansen so much as 1500*l.* for the telegraphic account of his expedition, and 4000*l.* for the articles just published.

WE are pleased to be able to report that Prof. W. J. Sollas returned to Dublin, in the best of health, on October 28, from his travels in the Pacific. It will be remembered that the Royal Society gave a grant to a Committee to investigate a coral reef by boring, sounding and other methods, and the island of Funafuti, in the Ellice Group, West Pacific, was selected as being a promising atoll. We have already (NATURE, vol. liv. p. 517) noted that the boring was unsatisfactory; but the other portion of the programme was successfully carried out, and large collections of the land and marine fauna were severally made by Prof. Sollas, Mr. C. Hedley, of the Australian Museum, Sydney, and Mr. Stanley Gardiner. The party also collected plants and all the objects of ethnographical interest on the island. Dr. Collingwood made measurements of the natives, and other observations on their physical anthropology. Prof. Sollas carefully studied the physiography and geology of the island, and kept daily records of the maximum and minimum temperatures. The soundings made by the *Penguin*, under Captain Field, were so complete that an accurate contour map can be made of the submarine slope; probably in no case has a coral island been so accurately surveyed. Numerous photographs were taken by Prof. Sollas and Dr. Collingwood. The expedition was eleven weeks on the island. Prof. Sollas then proceeded to Fiji, where he stayed about a month and made a special geological tour in the interior, accompanied by the Hon. Dr. Corney and the Hon. Mr. Udal. We understand that results of some importance will follow from this journey. After calling at Samoa, Prof. Sollas went to Honolulu and made some geological observations in the islands of Oahu and Hawaii. Mr. Hedley returned with his collections to Sydney, where he is working out his results. Mr. Gardiner is now in Rotumah. We hope that it will be possible to include *all* the results of this expedition in a single publication, instead of their being published in scattered papers. If this were done, we should have such an account of the physical structure, flora, fauna, and anthropology of a single coral island as has never yet been brought together in one volume. The scientific men associated on the expedition are now so widely scattered, that no time should be lost if their various observations are to be collected and coordinated.

THE committee appointed by the Entomological Society, for the protection of British Lepidoptera in danger of extermination, held a meeting on October 14; Prof. Meldola, President of the Society, being in the chair. Letters from the City of London Entomological and Natural History Society, the North London Natural History Society, and the Leicester Literary and Philosophical Society, expressing warm sympathy with the object of the committee, were read. After discussion of the best methods of securing the object of the committee, it was resolved to invite information as to species in special danger of extermination, with a view to future action.

HE is a bad workman who grumbles at his tools, and the student of science who neglects research because he does not possess apparatus ready-made and varnished by the instrument-maker, lacks the spirit of the investigator. Test the efficiency of the things at your disposal is good advice, for the knowledge and experience gained by direct communion with nature, even through the roughest apparatus, is a very valuable educational training. Because this is so, and because we hold our highest function to be the encouragement of research, we have pleasure in noting that "a Yorkshire lad," Mr. G. W. Watson, of Keighley, has obtained some wonderfully good Röntgen photographs by using an old home-made Wimshurst machine to illuminate a Crookes' tube. The machine gave a spark about 1¾ inches in length, and was without condensers. With this primitive equipment, good radiographs of the bones of the hand were obtained in twenty minutes. One of these pictures, and also a radiograph of an abnormally developed elbow, have been submitted to us; and both are very creditable productions. The definition is unusually clear, and the hollow structure of the bones is distinctly visible. Mr. Watson's success may induce others to see what they can do with simple means.

WHILE the bison of North America is on the point of extinction, the European bison, which is still found in Russia and the Caucasus, is sensibly decreasing in numbers, in spite of the efforts made for its protection by the Imperial Government. Herr Buchener (says the *Zoologist*), in a memoir on the subject recently presented to the Imperial Academy of Sciences at St. Petersburg, regards it as likely soon to share the fate of its American relative. In the forest of Bialowicksa, in the province of Lithuania, a herd of these fine animals has long been preserved, and forty years ago, namely in 1856, numbered about 1900, but of late years this has dwindled down to less than 500, and there is no encouraging sign of any material increase. Our contemporary points out that if the Russian Government would only give instructions to have some of the Caucasian bison captured alive and transported to Lithuania for the purpose of resuscitating the herd there, no doubt in a few years a marked improvement might be effected. The enterprise would necessarily be attended with considerable difficulty and great expense, but in view of the scientific importance which would attach to the result of the experiment, it would be well worth undertaking.

THE renowned "Bourbon" sugar-cane is so subject to diseases, particularly to attacks of Rind fungus, that the question of the most profitable variety of cane for cultivation in the Leeward Islands is of much interest and importance to the colony. Some facts are brought to bear upon this question in a report by Mr. F. Watts and Mr. F. R. Shepherd, published as a supplement to the *Leeward Islands Gazette*, detailing the results of experiments on the cultivation of different varieties of sugar-cane with the view of ascertaining which varieties are best able to resist disease. The results of their observations show that the best canes for planting in Antigua are those designated White Transparent, Naga B, Red Ribbon, Caledonian Queen, and Queensland Creole. These varieties held their own under different conditions of drought and infection; they were free from Rind fungus, and yielded juices of high purity and great saccharine richness. The Keni Keni cane, which, when it was first introduced into the colony, gave the best yield of any, has now fallen practically to the bottom of the list. It is an ally of the Bourbon, and is badly attacked by the Rind fungus. A curious fact is that both the Bourbon and Keni Keni canes should deteriorate in this manner, though the latter seems to have changed for the worse much more rapidly than the former. Further observation on this point would be of considerable interest in connection with the stability of varieties in relation to disease.

NOT so very long ago, the proposal to raise sugar-canes from the seeds would have been treated with ridicule, but, thanks to the work at Demerara and Barbados, and the experiments at the

Royal Botanic Gardens, Trinidad, it is now known that the sugar-cane will grow from seed, and that remarkable variations are produced. A short account of the share taken by the Trinidad Gardens in raising these seedlings is given in the Trinidad *Bulletin of Miscellaneous Information*, by Mr. J. H. Hart, the Superintendent. As a result of the experiments, sugar-canes have been produced that have given 25 per cent. above the yield of varieties commonly grown. If these varieties can be successfully got into plantations on a large scale, no further proof will be required of the value of the work done by Botanic Gardens. It is proposed to distribute cane plants of the new varieties early next year, and we trust that the results of their cultivation will be satisfactory in every sense of the word. Mr. Hart points out that the effort of the raisers of the sugar beet have long been directed to secure a strain of plants that would, while giving a large yield per acre, afford at the same time the maximum amount of sugar, and their efforts have been attended with great success, for it is well known that the yield from roots cultivated of recent years show a tremendous advance over the percentage yielded by the beet twenty years ago. Had the yield of the cane increased in the same proportion as that of beet, the sugar industry would not have suffered as it has done of late.

Prof. Ralph S. Tarr contributes to *Science* a description of the recent expedition to Greenland, conducted by Lieut. Peary. The principal geological results are briefly stated as follows:—"At Turnavik, on the Labrador coast, evidence of recent glaciation is abundant. The hills are all rounded; there has been little post-glacial decay, and the transported boulders, as well as the bed rock, are very fresh. Upon exposed rock faces, unprotected from the weather, glacial striæ are still very distinct. Granting equality of weathering, this region has been much more recently glaciated than regions of similar geological structure in New England. The amount of glacial carving has not been sufficient to lower the surface of the gneiss to the level of the pre-glacial decay in the trap-dike valleys." On Big Island and the neighbouring coast of Baffin Land, evidence of very recent elevation was found up to a height of 270 feet above sea-level. The results of the study of the Nugsuak peninsula are interesting. The peninsula extends twenty-four miles from the front of the Cornell glacier to the end at Wilcox Head, while the Duck Islands are at a distance of eight or ten miles from the mainland. The Cornell glacier was found to have undergone recently a rapid withdrawal, and its retreat is believed by Prof. Tarr to be a part of a general withdrawal of a vast ice sheet, which extended outward beyond the Duck Islands. The entire Nugsuak peninsula has been so recently glaciated, that striated rocks are still present even at the outer end.

According to the usually accepted theory of Crookes' tube, antikathodic rays are produced wherever kathodic rays impinge on a fixed obstacle. In the *Bulletin de l'Académie Royale de Belgique*, M. P. De Heen advances the theory that these rays result from encounters between molecules projected from the anode and kathode respectively. In verification of this view, experiments were made with a tube in which the usual anode was replaced by two parallel laminæ of aluminium at a small distance apart. When either of these laminæ was used as anode, the kathode being at the other end of the pear-shaped tube, antikathodic rays were observed; but these disappeared entirely when the two parallel laminæ were used as anode and kathode respectively. This result was easily explained by the fact that the space between the two surfaces was too small to allow of frequent collisions taking place between the anodic and kathodic projections. On the ordinary theory, however, the kathodic projections would traverse the space between the laminæ with great facility, thereby giving rise to a copious emission of antikathodic rays, contrary to observation.

The *Proceedings* of the fifty-fourth meeting of the American Association for the Advancement of Science, held at Springfield, Mass., in August and September 1895, have lately been published.

In the *Meteorologische Zeitschrift* for October, General Rykatcheff publishes a note on the meteorological observations at the St. Petersburg and Pavlovsk observatories during the solar eclipse of August 9.

The *Bulletin of the Torrey Botanical Club* for September reprints Dr. N. L. Britton's brief account of the Botanical Gardens of the world, given as the vice-presidential address before Section G of the last meeting of the American Association for the Advancement of Science. The total number is given as over 200, but some of them are little more than pleasure parks. Of the total number, Germany possesses 36, Italy 23, France 22, Russia 16, Austro-Hungary 13, Great Britain and Ireland 12, and the United States 10.

The *Bibliothèque universelle*, a monthly review now published in Lausanne, Switzerland, has recently celebrated the hundredth anniversary of its foundation. It was originally established in Geneva, under the title *Bibliothèque britannique*, by Frédéric Guillaume Maurice and the brothers Marc Auguste Pictet (pupil and friend of the famous naturalist Saussure) and Charles Pictet de Rochemont, its chief object being the diffusion of English ideas and scientific researches in France and Switzerland. It numbered among its earliest contributors Sir Humphry Davy, Edward Jenner, Sir Joseph Banks, the physicist Charles Earl of Stanhope, and, at a somewhat later period, Sir John Herschel.

Arrangements are being made to commemorate the sixtieth year of the reign of Her Majesty Queen Victoria by an exhibition at the Crystal Palace, to be opened on May 24, 1897. It is proposed to illustrate by models and practical examples the famous inventions in arts and industries during the past sixty years, and also the progress of other sides of national development. As a sort of prologue to this exhibition, a series of popular lectures, dealing with the advancements in science made during Her Majesty's reign, will be delivered during March and April next.

The next session of the Anthropological Institute commences on Tuesday, November 10. A number of interesting communications are promised, among others being papers by Prof. E. B. Tylor, on North American Wampum Belts; by Dr. Oscar Montelius, on the Tyrrhenians and the pre-classical period in Italy; by Dr. J. H. Gladstone, on the transition from the use of copper to the use of bronze; by Lieut. Boyle T. Somerville, R.N., on the natives of South Georgia (Solomon Islands); by Miss G. M. Godden, on the Nagas and other hill tribes of the North-East Indian frontier; by Dr. Colley March, Miss Christian Maclagan, and Mr. R. H. Mathews. At the first meeting Mr. H. Balfour, of the Pitt-Rivers Museum, Oxford, will exhibit a remarkable bow found in Egypt, and believed to be Assyrian, and will read the life-history of an Aghori Fakir, exhibiting drinking-bowls made from human skulls. Mr. C. H. Read will exhibit a curious wooden carving executed by a Haida Indian, apparently from a model of a sphinx; and a wooden dance-mask from the north-west coast of America. Mr. P. L. Sclater will exhibit a "draught-board" from Nyassaland; and Mr. Balfour will show a number of transparent sections of composite-bows of various times and countries.

Twelve years have elapsed since the publication of Phillips's well-known and widely-consulted "Treatise on Ore Deposits.' In this period the subject of metalliferous deposits has undergone such extensive changes, both material and theoretical, that Prof. Henry Louis, in preparing the second edition, which Messrs.

Macmillan and Co. will issue in a few days, has had to introduce many modifications of the original text, and make many additions. Especially is this the case in the first part of the work dealing with the classification and genesis of ore deposits. This has been entirely rewritten in order to bring it into accordance with modern ideas. The second part of the work, being mainly a record of facts and observations on ore deposits of the principal mining regions, has not needed to be recast, though the results of recent studies, and of newly-developed fields and deposits have been added. The work has thus been rejuvenated, and will continue to hold its high place among mining literature. Another new edition to be published by Messrs. Macmillan in a few days, is Ziegler's "Special Pathological Anatomy." The first English edition of this standard work was published in 1884, but the edition (the third) shortly to be issued differs from it very considerably, having been translated from the eighth German edition. So great have been the advances in pathological anatomy during the past twelve years, that the text has had to be completely rewritten. The forthcoming volume has been translated and edited by Dr. Donald MacAlister and Dr. Henry W. Cattell. The second volume of the work is in the press, and it will be followed by a new version of the part on general pathological anatomy.

THE researches of Émil Fischer on the action of phenylhydrazine on the various sugars have shown that either a simple hydrazone is formed, by the reaction of the aldehyde or ketone group of the sugar with the amido-group of the hydrazine, or that, in addition to this, the hydrogen atoms, combined with the carbon atom adjacent to the carbonyl group, are removed, and a second molecule of phenylhydrazine enters into reaction, an osazone being formed. In a paper published in the current number of the *Berichte*, E. Davidis describes two new types of hydrazine derivatives of the sugars, which have been obtained in the laboratory of Prof. Curtius. When a sugar such as glucose is warmed with hydrazine hydrate and a little methyl alcohol, two molecules of the sugar react with one of the hydrazine, and glucosaldazine, $C_6H_{12}O_5:N.N:C_6H_{12}O_5$, is produced. Similar compounds are formed by fructose and arabinose, and they are all readily hydrolysed by dilute acids. Compounds of the second type are formed when the sugar is treated with an acid hydrazide, such as benzhydrazide, $C_6H_5.CO.NH.NH_2$, in the presence of dilute alkalis. Under these circumstances, no less than *four* molecules of the hydrazide react with one molecule of the sugar. The compound produced from glucose, which the author terms glucosebenzosazone, therefore resembles glucosazone in constitution, but differs from it inasmuch as the removal of the hydrogen atoms and reaction with the hydrazide has been extended to three consecutive carbon atoms. A portion of the benzhydrazide is simultaneously decomposed with formation of ammonia and benzoic acid. Lævulose yields precisely the same compound as glucose. It has, so far, been found impossible to prepare a benzosazone containing either more or less than four hydrazine groups. These compounds crystallise well, and melt at a comparatively high temperature; and it is therefore possible that they may play an important part in the investigation of the very complicated group of compounds to which the sugars belong.

THE additions to the Zoological Society's Gardens during the past week include a Mozambique Monkey (*Cercopithecus pygerythrus*, ♂) from South-east Africa, presented by Dr. John Archibald; a Hocheur Monkey (*Cercopithecus nictitans*, ♂) from Congoland, presented by the Rev. Lawson Forfeitt; a Syrian Bear (*Ursus syriacus*, ♀) from Western Asia, presented by Mr. G. A. Schenley; a Garden Dormouse (*Myoxus quercinus*), European, presented by Mr. W. H. St. Quintin; two White Storks (*Ciconia alba*), European, presented by Miss Agnes Woodroffe; a Black-backed Piping Crow (*Gymnorhina tibican*) from Australia, presented by Mr. Charles G. Murrell; four European Tree Frogs (*Hyla arborea*) from Italy, presented by Mrs. Kneeshaw; a Beccari's Cassowary (*Casuarius beccarii*) from New Guinea, a Night Heron (*Nycticorax griseus*), two Purple Herons (*Ardea purpurea*), European, two Black-spotted Teguexins (*Tubinambis nigro-punctatus*) from South America, deposited; two Common Sheldrakes (*Tadorna vulpanser*), European, three Mandarin Ducks (*Œx galericulata*) from China, a White-faced Tree Duck (*Dendrocygna viduata*) from Brazil, received in exchange.

OUR ASTRONOMICAL COLUMN.

STRASSBURG OBSERVATORY.—The first contribution to astronomical science of the Kaiserlichen Universitäts-Sternwarte in Strassburg is contained in a handsome volume just published by the Director of the Observatory, Prof. E. Becker. This observatory, it may be remembered, was instituted in the year 1872, Dr. August Winnecke being called upon to fill the post of Professor of Astronomy, and make plans for the arrangements of the buildings and instruments. It is quite worth while recording the fact that almost one of the first acts of Germany after the conclusion of the war, was to arrange for the building of this observatory, showing that, to have an astronomical observatory, which should be a seat "der exacten Wissenschaften," was almost as important as a fortress. No less extraordinary is it that this volume of the "Annalen," just published, should contain the first full description of the buildings and instruments almost fifteen years after they have been set up. We are led to infer from this that the object of the Germans is, in any case, to collect facts, even if they cannot momentarily be published. The buildings were commenced in 1877, and by the summer of the year 1881 work had already begun. In this, the first volume of the "Annalen," Prof. Becker gives a full description of the different buildings and of the various instruments housed in them, illustrating them with eighty excellent photogravure plates. Among these latter are a large refractor of 487 mm. aperture and 7 m. focal length, by Merz, on a mounting by the brothers Repsold; a large comet-seeker with an objective, by Merz, of 162 mm. aperture and a focal length of 1·3 metres; a smaller comet-seeker, a transit instrument by Cauchoix, an orbit-finder (Bahnsucher), an alt-azimuth, and a Repsold meridian circle, having an object-glass of 160 mm. diameter and a focal length of 1·888 metres, by Merz. A thorough and complete investigation of this last-mentioned instrument was undertaken, the results of which are given in full detail. The observations which are here published extend from 1882 March 15 to 1886 September 9, and consist of meridian observations of the sun and chief planets, and of those stars, the positions of which were required for such different objects as comparison stars of comets, angular values of the heliometer scales, longitude determinations. In June 1884 the programme of work was considerably increased, the determination of the positions of 306 Anschlusssterne for the southern zones, and also of eighty-three stars of the southern fundamental catalogue of the Astronomischen Gesellschaft being the chief additions. Following the list of observations are the corrected readings of the meteorological instruments, the temperatures in the basement under the transit circle, and a short account of the climate of Strassburg as gathered from the meteorological observations made from 1873–79.

MARS IN AUGUST LAST.—Prof. V. Cerruli contributes some of his notes on the appearance of the Martian disc, during last August, to *Astr. Nach.*, No. 3384. Of the southern cap, he says, we have no sign. This fact cannot be accounted for solely by reason of perspective; it seems, however, that the southern snows, which diminished very rapidly in June and July, have undergone complete liquefaction. (The southern solstice occurred on July 13.) Ramification of the northern snow took place, according to his opinion, on August 25; on that day he observed for the first time "a flash of lightning more or less intense at the extreme north of Elisium," and this apparition was successfully repeated on the following days. It may be mentioned here that the bright flashes noted by the Lick observers, and others, were seen towards the southern pole in the region known as Chersonesus. With regard to the canals, he says that he was